

Marked-Up CopyIn the Drawings:

Kindly substitute the enclosed FIGS. 6A-6B and 7 for the prior FIGS. 6A-6B and 7 submitted on November 2, 1999.

In the Specification:

Please amend the paragraph at page 9, lines 12-15, by substitution as follows:

Information bits in the short MAC header ~~410~~400 are protected by the CRC sequence 410, which is preferably 8 bits, for header error detection. The short MAC header ~~410~~400, shown in FIG. 6A as 34 total bits, is then coded using a punctured rate 1/3 code to obtain 76 bits.

In the Claims:

Please amend claims 1-2 and 13 by substitution as follows:

1. A wireless communication system being capable of supporting link adaptation comprising:

a transmitter for forming fixed length radio link control (RLC) blocks, for forming fixed length coded sub-blocks from the RLC blocks, ~~and for configuring the coded sub-blocks into~~ transmission units being capable of supporting link adaptation at multiple code rates, for forming a downlink segment from the transmission units, for interleaving the downlink segment into an interleaved downlink segment, and for transmitting the interleaved downlink segment.

2. The wireless communication system as recited in claim 1 comprising:

a receiver for receiving the ~~transmission units~~downlink segment, for obtaining the transmission units from the downlink segment, and for decoding the RLC blocks from the transmission units.

13. A method for communicating in a wireless communication system being capable of supporting link adaptation at multiple code rates, the method comprising the steps of:

forming fixed length radio link control (RLC) blocks;

configuring the RLC blocks into transmission units being capable of supporting link adaptation at multiple code rates;

forming a downlink segment from the transmission units; and

interleaving ~~transmitting the transmission units~~the downlink segment into an interleaved downlink segment; and

transmitting the interleaved downlink segment.

19. The method as recited in claim 17 wherein the step of transmitting comprises the step of transmitting the ~~transmission units~~interleaved downlink segment over GSM bursts.

25. The method as recited in claim 13 wherein the step of ~~transmitting~~forming a downlink segment comprises the steps of:

forming a header indicative of the transmission units to be transmitted; and

~~transmitting the header to indicate which transmission units are being transmitted~~forming a downlink segment from the transmission units and the header.

Please amend claim 31-32 and 37 by substitution as follows:

31. The method as recited in claim 17 wherein the step of transmitting comprises the step of transmitting the ~~transmission units~~interleaved downlink segment over a general packet radio services system.

32. A method for communicating in a wireless communication system being capable of supporting link adaptation between multiple code rates and incremental redundancy, the method comprising the steps of:

forming fixed length radio link control (RLC) blocks;
combining the RLC blocks with a cyclic redundancy check sequence for error detection to form error coded RLC blocks;
processing the error coded RLC blocks to form coded sub-blocks;
~~forming a header indicative of the transmission units;~~
assembling groups of the coded sub-blocks into transmission units based on the multiple code rates;
forming a header indicative of the transmission units;
forming a downlink segment from the transmission units and the header; and
interleaving ~~transmitting the transmission units~~ the downlink segment into an interleaved downlink segment; and
~~and the header~~transmitting the interleaved downlink segment to a receiver.

37. The method as recited in claim 36 wherein the step of transmitting comprises the step of transmitting the ~~transmission units~~interleaved downlink segment over GSM bursts.

Remarks

Entry of the above-noted amendments, reconsideration of the application, and allowance of all claims pending are respectfully requested. By this amendment, claims 1-2, 13, 19, 25, 31-32, and 37 are amended. These amendments to the claims constitute a bona fide attempt by applicants to advance prosecution of the application and obtain allowance of certain claims, and are in no way meant to acquiesce to the substance of the rejections. The specification has been amended to correct typographical errors. The drawings have been amended. Support for the amendments can be found throughout the specification (e.g., page 6, line 23 to page 7, line 6, page 7, lines 15-18, page 8, lines 1-8 and 28-30, page 9, line 21 to page 10, line 11, and page 12, lines 1-17), claims, and drawings (e.g., FIGS. 3-5) and thus, no new matter has been added. Claims 1-44 are pending.

Allowable Subject Matter:

Claims 6-7 and 12 were objected to as being dependent upon a rejected base claim, but were indicated as allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicants gratefully acknowledges this indication of allowability, and is merely deferring the rewriting of claims 6-7 and 12 in independent form including all the limitations of the base claim and any intervening claims, pending a determination of patentability of base claim 1.

Claims 18, 23-24, and 27-29 were objected to as being dependent upon a rejected base claim, but were indicated as allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicants gratefully acknowledges

this indication of allowability, and is merely deferring the rewriting of claims 18, 23-24, and 27-29 in independent form including all the limitations of the base claim and any intervening claims, pending a determination of patentability of base claim 13.

Claims 42-44 were objected to as being dependent upon a rejected base claim, but were indicated as allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicants gratefully acknowledges this indication of allowability, and is merely deferring the rewriting of claims 42-44 in independent form including all the limitations of the base claim and any intervening claims, pending a determination of patentability of base claim 32.

Drawings:

Substitute FIG. 6A submitted herewith corrects unintended errors in omitting reference numerals for the short media access control (MAC) header 400, the code rate (CR) field 402, the coded sub-block sequence number (CSN) field 404, the temporary flow identifier (TFI) field 406, the general Other field 408, and the cyclic redundancy check (CRC) sequence 410 from the prior FIG. 6A submitted November 2, 1999.

Substitute FIG. 6B submitted herewith corrects unintended errors in omitting reference numerals for the first, second, modified second, third, and modified third extended media access control (MAC) header formats 412, 418, 426, 428, and 438, the coded sub-block sequence number (CSN) fields 414, 416, 420, 422, 424, 430, 432, 434, and 436, and incremental coded sub-block sequence number (ICSN) fields 422a, 422b, 432a, 432b, 436a, and 436b from the prior FIG. 6B submitted November 2, 1999.

Substitute FIG. 7 submitted herewith corrects unintended errors in omitting reference numerals from the extended media access control (MAC) header formats 500, 502, 504, and 506, the coded sub-block sequence number (CSN) fields 508, 510, 512, 514, 516, 518, 526, 528, 530, 532, 534, 536, 538, 542, and 544, the temporary flow identifier (TFI) field 520, the Other field 522, the cyclic redundancy check (CRC) field 524, and the reserved fields 540, 546, and 548 from the prior FIG. 7 submitted November 2, 1999.

The present corrections are highlighted in red ink in the FIGS. 6A-6B and 7 submitted herewith. In addition, the substitute FIGS. 6A-6B and 7 are being provided to the Official Draftsperson under separate cover. Approval and entry of the substitute FIGS. 6A-6B and 7 are respectfully requested.

Claim Rejections - 35 U.S.C. §102

Claims 1-4, 9-11, 13-17, 19-21, and 30-31 are rejected under 35 U.S.C. §102(e) as being anticipated by Schramm, et al. (U.S. Patent No. 6,208,663; "Schramm"). This rejection is respectfully, but most strenuously, traversed.

It is well-settled that there is no anticipation unless (1) all the same elements are (2) found in exactly the same situation and (3) are united in the same way to (4) perform the identical function. Since Schramm is missing at least one element of each of applicants' independent claims, applicants respectfully submit that the claimed invention is not anticipated by Schramm, as further discussed below.

Applicants' invention, as defined by independent claim 1, is directed to a configuration that includes:

a transmitter for forming fixed length radio link control (RLC) blocks, for forming fixed length coded sub-blocks from the RLC blocks, for configuring the coded sub-blocks into transmission units being capable of supporting link adaptation at multiple code rates, for forming a downlink segment from the transmission units, for interleaving the downlink segment into an interleaved downlink segment, and for transmitting the interleaved downlink segment.

Applicants respectfully submits that the applied reference, with or without modification, assuming, *arguendo*, that the modification of the applied reference is proper, does not teach or suggest one or more elements of the claimed invention, as further discussed below.

For explanatory purposes, applicants discuss herein one or more differences between the applied reference and the claimed invention with reference to one or more parts of the applied reference. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the applied reference correspond to the claimed invention.

Applicants respectfully submit that the applied reference does not teach or suggest one or more elements of the claimed invention. A careful reading of the applied reference fails to teach or suggest, for example, the base transceiver station 20 for forming the downlink segment from the transmission units, for interleaving the downlink segment into the interleaved downlink segment, and for transmitting the interleaved downlink segment.

Schramm (col 5, lines 30-32, col 6, lines 48-57, FIGS. 4a and 4b) discloses the base transceiver station 20 for encoding, interleaving and transmitting an RLC block.

Each RLC block is interleaved over four bursts (timeslots) after FEC encoding. Note that although the bursts are illustrated as being next to one another in the Figures, these bursts are spread out

in time as appropriate for the exemplary TDMA channel supporting this connection. In particular, block 40 is FEC encoded using an FEC coding scheme associated with system 10, and interleaved over bursts 42-48.

Schramm discloses encoded RLC blocks interleaved over bursts. Schramm fails to disclose segmenting the encoded RLC blocks into the transmission units, forming the header indicative of the transmission units and assembling the transmission units and the header into the downlink segment before interleaving the downlink segment over the four bursts. Simply missing from Schramm is any mention of the transmitter for forming the downlink segment from the transmission units, for interleaving the downlink segment into the interleaved downlink segment, and for transmitting the interleaved downlink segment.

So, Schramm fails to satisfy at least one of applicants' claim limitations.

Furthermore, the Office Action does not allege that the art of record provides any teaching, suggestion, or incentive for modifying Schramm to provide the claimed configuration. Applicants respectfully submit that these documents fail to provide the express teaching, suggestion, or incentive, and the claimed invention is thus patentable over the art of record.

For all the above reasons, independent claims 1 and 13 presented herewith are believed neither anticipated nor obvious over the art of the record. The dependent claims 2-4, 9-11, 14-17, 19-21, and 30-31 are believed allowable for the same reasons as the independent claims 1 and 13, as well as for their own additional characterizations.

Withdrawal of the §102 rejection is therefore respectfully requested.

Claim Rejections - 35 U.S.C. §103:

Claims 25-26 and 32-41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Schramm in view of Trompower, et al. (U.S. Patent No. 5,950,124; "Trompower"). This rejection is respectfully, but most strenuously, traversed.

Applicants' invention, as defined by independent claim 32, is directed to an approach that includes:

forming fixed length radio link control (RLC) blocks;

combining the RLC blocks with a cyclic redundancy check sequence for error detection to form error coded RLC blocks;

processing the error coded RLC blocks to form coded sub-blocks;

assembling groups of the coded sub-blocks into transmission units based on the multiple code rates;

forming a header indicative of the transmission units;

forming a downlink segment from the transmission units and the header;

interleaving the downlink segment into an interleaved downlink segment; and

transmitting the interleaved downlink segment to a receiver.

Applicants respectfully submit that Schramm does not teach or suggest one or more elements of the claimed invention. A careful reading of Schramm fails to teach or suggest, for example, assembling the coded sub-blocks into transmission units, forming the header indicative of the transmission units, forming the downlink segment from the transmission units and the

header, interleaving the downlink segment into the interleaved downlink segment, and transmitting the interleaved downlink segment to the receiver.

Schramm (col 6, lines 48-57, FIGS. 4a and 4b) discloses encoding, interleaving and transmission of an RLC block.

Each RLC block is interleaved over four bursts (timeslots) after FEC encoding. Note that although the bursts are illustrated as being next to one another in the Figures, these bursts are spread out in time as appropriate for the exemplary TDMA channel supporting this connection. In particular, block 40 is FEC encoded using an FEC coding scheme associated with system 10, and interleaved over bursts 42-48.

Schramm discloses encoded RLC blocks interleaved over bursts. Schramm fails to disclose segmenting the encoded RLC blocks into the transmission units, forming the header indicative of the transmission units and assembling the transmission units and the header into the downlink segment before interleaving the downlink segment over the bursts. Simply missing from Schramm is any mention of assembling the coded sub-blocks into transmission units, forming the header indicative of the transmission units, forming the downlink segment from the transmission units and the header, interleaving the downlink segment into the interleaved downlink segment, and transmitting the interleaved downlink segment to the receiver.

So, Schramm fails to satisfy at least one of applicants' claim limitations.

The shortcomings of Schramm relative to certain elements of the claimed invention have been discussed above. To account for at least one of these deficiencies, the Office Action proposes a combination of Schramm with Trompower. However, Trompower does not overcome the deficiency of Schramm. Applicants respectfully submit that the proposed combination of Schramm with Trompower fail to provide the required approach, assuming, *arguendo*, that the combination of Schramm with Trompower is proper.

Trompower discloses a header in a frame containing code rate information (column 16, lines 24-35, FIG. 3A).

The base station 210, 215, on the other hand, will not know which data rate the mobile terminal 230 will choose, or which of several mobile terminals will transmit a packet. Therefore, the base station 210, 215 would ordinarily be required to simultaneously be able to detect all three data rates. To provide for a more simplified base station 210, 215 receiver system, however, the network protocol requires all packets to begin with a header 302 (FIG. 3A) transmitted at the mid or slow data rate.

Trompower discloses forming of the header 302 and transmitting the header 302. Trompower fails to disclose segmenting the encoded RLC blocks into the transmission units, forming the header indicative of the transmission units and assembling the transmission units and the header into the downlink segment before interleaving the downlink segment over the bursts. Simply missing from Trompower is any mention of forming the header indicative of the transmission units, forming the downlink segment from the transmission units and the header, interleaving the downlink segment into the interleaved downlink segment, and transmitting the interleaved downlink segment.

So, Trompower fails to satisfy at least one of applicants' claim limitations.

Schramm and Trompower both fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in Schramm or Trompower of forming fixed length radio link control (RLC) blocks, combining the RLC blocks with a cyclic redundancy check sequence for error detection to form error coded RLC blocks, processing the error coded RLC blocks to form coded sub-blocks, assembling groups of the coded sub-blocks into transmission units based on the multiple code rates, forming a header indicative of the transmission units, forming a downlink segment from the transmission units and the header,

interleaving the downlink segment into an interleaved downlink segment, and transmitting the interleaved downlink segment to a receiver.

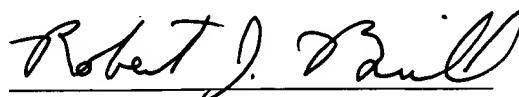
Furthermore, the Office Action does not allege that the art of record provides any teaching, suggestion, or incentive for modifying Schramm and/or Trompower to provide the claimed approach. Applicants respectfully submit that these documents fail to provide the express teaching, suggestion, or incentive, and the claimed invention is thus patentable over the art of record.

For all the above reasons, the independent claim 32 presented herewith is believed neither anticipated nor obvious over the art of the record. The dependent claims 25-26 (dependent from the independent claim 13) and the dependent claims 33-41 (dependent from the independent claim 32) are believed allowable for the same reasons as the corresponding independent claims, as well as for their own additional characterizations.

Withdrawal of the §103 rejection is therefore respectfully requested.

In view of the above amendments and remarks, allowance of all claims pending is respectfully requested. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicants' attorney.

Respectfully submitted,



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